AMSAT SATELLITE REPORT

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Flash Flash Flash

In a story breaking at press time, a contingent of ARRL Officials made an unprecedented contribution to AMSAT for the Phase III program. Representing the ARRL Foundation, Mr. George DuPont, WA1SVY presented AMSAT President Tom Clark, W3IWI, with a check for $56,000. Also on hand for the presentation at the AMSAT Laboratory at the Goddard Space Flight Center was ARRL Atlantic Division Vice Director Hugh Turnbull, W3ABC. AMSAT Officials present included Vice Presidents K1HTV and W3GEY, Office Manager Martha Saragovitz, AMSAT Staff Engineer ZS1FE, Gordon Hardman and a surprise, honored guest XE1TU, Dave Liberman, President of AMSAT Mexico. Photos and additional news on this major event will appear in the next *ASR*.

Phase III Countdown in ASR

In the year before the anticipated launch of Phase IIIA, G3IOR, Pat Gowen, edited a management-oriented newsletter called *Phase III Countdown*. This monthly publication was sent to all IARU member societies and AMSAT Officials as well as numerous other interested organizations. Since *ASR* has as its readership the same community of organizations, officials and satellite users, in the months to come *ASR* will carry the Phase III countdown theme forward to the launch of Phase IIIB in 1982. *ASR's* readership now includes virtually every affiliated amateur satellite organization and many of the general amateur radio publications.

ORBIT Magazine to Carry Ads

ORBIT Magazine will begin to carry ham-ads in issue #9. Requirements and pricing will appear in *ORBIT* #8 This program will be advanced on a trial basis. There has often been an expression by amateur satellite devotees that the particular equipment employed for their interests do not have a specifically identified marketplace. The newcomer is thus faced with a rather formidable problem in locating good used OSCAR equipment. It's certainly out there somewhere but just as trying to find the proverbial needle, trying to locate satellite equipment is more challenging than, say, finding a TS-520. When was the last time you saw an ad for an F9FT 9/19 for example? Or a MMT432-28S? The trial ads in *ORBIT*, it is hoped, will help to solve that sort of problem.

ESA Council Affirms AMSAT Slot

In a telex to AMSAT DL Headquarters in Marburg, West Germany, ESA (European Space Agency) Director General Erik Quistgaard confirmed that AMSAT will obtain its launch in 1982. The co-passenger aboard the Ariane will be ECS-1, the European Communications Satellite which will provide commercial service.

What was not specified in the telex was a particular date, though AMSAT officials suspect the so-called "nominal" launch window is generally centered on October 1982. There has been a strong suggestion that the launch might be advanced. If the advance were made, the launch of AMSAT's Phase IIIB might come as early as April 1982. However, a more realistic date, according to Engineering Vice President W3GEY, Jan King, is June 1982, "if any advance takes place."

In related actions, AMSAT DL President Karl Meinzer, DJ4ZC, was in Paris last week for the initial mechanical/electrical interface meeting with ESA officials. The meeting transpired with only positive results. Meanwhile, technicians at Marburg had begun the construction of an adapter cone to mate Phase IIIB to the SYLDA. The SYLDA is the container in which ECS-1 will ride atop Ariane's third stage. AMSAT will ride on the very top of the SYLDA and thus be on the very top of Ariane rather than the configuration used on LO2. There Phase IIIA rode on the side of the application technology capsule (CAT) and just beneath Firewheel.

In connection with Firewheel, the experimenters who built the ill-fated Firewheel satellite at the Max Planck Institute have recently announced that they too have a replacement satellite for the vehicle lost on LO2. The Institute is developing a new, multi-spacecraft experiment to probe the solar wind. This will be a partial follow-up to the lost Firewheel. Called AMPTE (Active Magnetospheric Particle Tracer Explorer), the experiment will release quantities of lithium and barium into the solar wind and the "tail" of Earth's magnetosphere. The magnetosphere is a very large region of space around the earth in the shape of a torus (donut) and which is responsible for the famous Van Allen Radiation Belts which are high energy particles trapped by the belts. The "tail" of the mangetosphere is the elongation of the torus "downwind" due to the interaction of the solar wind and the magnetosphere. AMPTE will explore the mass transfer from the solar wind into the Earth's magnetosphere and circulation of the matter inside the tail and magnetosphere. Present anticipated launch date for AMPTE is 1984 aboard a NASA Thor-Delta from Cape Canaveral.

Ariane/ALINS Success!

It was very good news indeed that originated in the steamy jungle of Kourou, French Guiana, South America recently. It's Early Friday morning, 19 June when the sleek silver rocket painted with the flags and hopes of a European community virtually leaps from the tropic floor to the climateless boundaries of planet Earth. And with its swift ascent, the fortunes of the European Space Agency's Ariane and the dozens of prospective "passengers" for the world's newest heavyweight launcher rose as well. The success this past June was especially gratifying to ESA after a 13 month stand-down because of the disastrous failure of the prior test launch May 23, 1980. On that occasion the LO2 Ariane vehicle ungraciously deposited AMSAT's Phase IIIA satellite and the Firewheel satellite of the Max Planck Institute at fifty fathoms.

The unqualified success of LO3 means, however, ESA is back in the match; the game being the much discussed competition between NASA and ESA for future launch business. AMSAT's spirits were equally buoyed by the LO3 success since it marks a strong comeback from the LO2 debacle. And, while the LO3 success does not guarantee AMSAT a particular launch date for Phase IIIB, it is certain that had LO3 met a fate similar to that of LO2, a 1982 Ariane launch for Phase IIIB would have been virtually out of the question. Furthermore, the ability to resolve the extraordinarily complex problems associated with the combustion instability at the root of the LO2 failure illustrates both the skill and determination of ESA, CNES and SEP.*

The news of the LO3 launch was carried in real-time by ALINS (AMSAT Launch Information Network/Service) to amateurs around the world. The 3-station network comprised WA3NAN, the club station at the Goddard Space Flight Center, Greenbelt, Maryland; W6VIO, the club station at the Jet Propulsion Laboratory, Pasadena, California; WA2LQQ, the station of *ASR* Editor and AMSAT Bulletin Station operator Vern Riportella.

WA3NAN was staffed by AMSAT Operations Vice President K1HTV and his harmonic Andy, KA1GD, and operated on 14.282 MHz covering North America. W6VIO was operated by Jim Lumsden, WA6MYJ and George Morris, W6ABW. The arrangements for use of W6VIO were made by ARRL Southwest Division Director Jay Holladay, W6EJJ. Jay is Chairman of the Amateur Satellite Service Council (ASSC). W6VIO provided 40 meter coverage to Western North America and 20 meter coverage to Asia/Pacific. The 20 meter link was especially effective providing excellent signals to Japan, Philipines and Okinawa. WA2LQQ covered Europe on 15 meters beginning just after the band opened for the morning. All three stations were linked to the Mission Control Center at Goddard where AMSAT Vice President for Engineering Jan King, W3GEY, held forth. Also on hand at Goddard were ZS1FE, W4PUJ, W6SP. Paralleling the success of Ariane LO3, this ALINS activity was a notable success. Our thanks, on behalf of all those who monitored, to those who made ALINS work so well!

*CNES is the French National Space Agency
SEP is the prime contractor for the Viking V first-stage engines used by Ariane.

AO-7 Alive But . . .

The spacecraft emergency situation continues for AMSAT-OSCAR 7 while AMSAT Officials continue their efforts to learn both the cause of the failure in mid-June and the best possible plan for maximizing recovery prospects. There is solid evidence that the transponder is still functional though not operational since the power bus is apparently being shunted by a very heavy load. The best working hypothesis is that the NiCad cell which failed open in 1978 has, because of recent thermal stresses associated with the eclipse period, now come back on-line. However, in the interim (since 1978) one or two of the remaining nine cells in series has failed shorted. The solar cells are then looking at a relatively low impedance and the potential at the active hardware (transponder, command decoder, etc.) is lower than the minimum necessary for operation. The one slim hope remaining that AO-7 will return to any semblance of its former self is that the "78" cell will again go open. K1HTV reports that reliable telemetry showed that after initial entry into the earth's shadow on/about 22 May, the temperature of the battery dropped about 5°C until the failure occurred 12 June. The eclipse period will end on/about 12 July and the satellite can be expected to warm by a few degrees thereafter. Is the "78" cell failure reversible? Recent experience and the Second Law of Thermodynamics notwithstanding, we can hope.

AMSAT Contests Nixed

AMSAT members have apparently expressed large-scale indifference to the prospect of AMSAT sponsoring a short term contest on the birds this autumn. *ASR* is aware of only a dozen comments received in response to a call for comments made over the HF nets and here in the pages of *ASR* (#7, May 18, 1981, page 2). Of the comments expressed, half were pro; the other half con. Based on this apparent indifference, AMSAT Officials doubted openly that a contest could be justified in terms of cost/benefit.

T-Shirt Limerick Winners Aired

The decision of the judges is in and the winners of AMSAT's "Hams-in-Space" T-shirt limerick contest are:

First Place: KR6B, Brian Tandrow of Simi Valley, California.

Second Place: KO5I, Doug Loughmiller of Paris, Texas.

Third Place: K2ZRO, Kaz Deskur of Endicott, New York.

Honorable mention goes to G3IOR, W3HV and K1WHS.

Brian's winning limerick was:

There once was a ham from L.A.
Who said, "For this shirt I must pay,
Unless I can rhyme
About pigs, one more time...
And help get Phase 3 on its way."

Congratulations to the winners. Your Hams-in-Space T-shirts will be on their way. Thanks to all the participants, and keep thinking T-shirt, Hams-in-Space and Phase III.

ASR *Spotlight on WØSL*

When does the professional engineer stop and the basement/garage tinkerer take over? With this Spotlight feature, Roy Welch, WØSL, it is truly hard to tell. Roy is one of the best examples of AMSAT's dyed-in-the-wool homebrewer...the kind of fellow that has followed amateur radio into the satellite era without falling out of touch with our time-honored values.

During his 29 years with the Network Engineering Department of Southwestern Bell Telephone Co., Roy has witnessed the evolution of communications from wireline to radio, and finally into space. Beginning with a modified surplus SCR-522 in 1954, Roy helped to pioneer two meters in St. Louis, and today regards the VHF/UHF spectrum as an exciting source of technical challenge. It is a safe bet that WØSL will explore the microwave domain soon, and that Missouri will be one of the first states heard over the new Phase III L-transponder!

The true spirit of amateur radio is evident in the WØSL shack, with the OM's pride gleaming almost as brightly as the knobs and dials. Only a Microwave Modules transverter and the antenna rotors can be considered "store-bought", with kits and homebrew gear sharing the honors. A Collins receiver on the left, you say? Highly modified, Roy points out, with so many changes its designers would hardly recognize it. Isn't that an SB-200 amplifier on the shelf? Appearances can be deceiving as even a Heath engineer would be hard-pressed to spot this skillful WØSL copy. Roy is proud of his all-homebrew OSCAR station, based upon the DJ6ZZ transmit converter and DJ3SC linear amplifier driving the output stage from a vintage Motorola T44. The combination evidently works well, with 4 continents, 42 countries, and nearly 700 contacts in the logbook so far this year! Satellite WAS and the valued RS1/RS2 Bronze medal testify to the prowess of the designer/engineer as operator as well.

A frequent club and hamfest-convention guest, Roy is quick to point out that homebrew gear and simple antennas can open the door to satellite operation for the beginner. As one who made his first OSCAR contact on a basement antenna, he ought to know! Even with increasingly sophisticated amateur equipment, WØSL makes newcomers to the hobby aware that simplicity and ingenuity are as valuable to amateur radio in the space age as they were in the spark age. For proof, one need look no further than WØSL's homebrew Mode J preamp, or SSTV monitor, both of which rival the appearance and performance of commercial units.

In addition to designing, building, and operating his own station, Roy's never too busy to help a neighboring ham with his satellite gear, or to tell AMSAT's story to a local club or group. It seems his enthusiasm hasn't diminished much since Roy (W5SLL at the time) tracked early Explorer and Vanguard "birds" from his Texas QTH.

AMSAT is proud of Missouri Area Coordinator Roy Welch, and if the *ASR* Spotlight seems to shine a bit brighter this week, it is no doubt because of the pride we see reflected in the WØSL shack.

ORBIT *Editorial Shift*

With the mailing of *ORBIT* Magazine #7, Editor G3ZCZ, Joe Kasser, has stepped down as Editor of AMSAT's major publication after seven years of unmitigated service to the organization. Beginning with the *AMSAT Newsletter* in 1974, Joe has carried forth the Editors task with talent, enthusiasm and endurance until this month. Now Joe and family are moving to Israel where he will be working for (you guessed it) a commercial satellite communications concern. Joe assures his devoted readers that his typewriter will continue to churn out material for *ORBIT* from 4X4-land though there likely will be a hiatus while the relocation is in progress.

On July 12 Joe was honored and thanked for his years of service when a contingent from AMSAT Headquarters bid him farewell at a gala dinner affair. Joe was presented the first AMSAT E^3 Award for "Excellence, Effort and Endurance" by AMSAT President Tom Clark, W3IWI, on behalf of the thousands of grateful AMSAT members around the world who have read and enjoyed Joe's work these many years. Shalom!

ASR Editor WA2LQQ will be Acting Editor-In-Chief for the next several issues of *ORBIT* while staff reorganization continues and until a new Editor is named. Editors N6TE, W4PID and W1XT will be assuming greater responsibilities in the new structure. Additional contributing Editors are actively being sought as well.

Swiss DXpedition Underway

Peter W. Frey, HB9MQM, of Baden and a member of the USKA (Union of Swiss Short Wave Amateurs) has announced that HB9APJ and HB9MPU will be operating a satellite DXpedition to Greenland from July 5 through July 25. They will be operating Mode A only using the callsign OX3HB from Angmagssalik at 66°N, 37°W. QSLs to Swiss Bureau c/o HB9APJ. Tks HB9MQM!

ORBIT Calendar Correction

Noticeable changes are occurring in the orbit of AMSAT-OSCAR 8 apparently as the result of major seasonal variations. The precipitous fluctuation in the rate of change of the orbital period has caught the predictors off-stride. As a result, there will be significant differences between the Project OSCAR calendar (for July through September) and the actual AO-8 orbit. At press time the difference was nominally one minute and increasing at the rate of about one second per day.

The sudden change represents a significant diminution in the rate of change of the orbit. Through late Spring, AO-8's orbital period had been decreasing, on average, by about 314 microseconds per orbit. However, as of 7 July, the rate of change had decreased to only 114 microseconds per orbit. The precise causes of the rapid change are not well understood although it is generally conceded that seasonal variations in lunar tidal effects, solar heating of the atmosphere and the effects of the Earth's flattened poles are all component forces driving the changes.

The discrepancy was first reported by WD4FAB, Dick Jansson, on the 20 meter International AMSAT Net on Sunday, 5 July. WD4FAB's estimate was, made admittedly with a very crude methodology, that on 5 July, the satellite was running about one minute late. Remarkably, in a call to *ASR* on 7 July, Project OSCAR President, Dr. John Pronko, W6XN, reported that the actual discrepancy was exactly 61 seconds! It seems WD4FAB hit the number right when he estimated one minute.

The result of all this for the user community is, that compared to the Project OSCAR calendar, AO-8 will be running LATE. You should therefore ADD a correction factor to the times shown for EQX in the calendar. The magnitude of the correction factor to be added will increase over the coming months. As of 7 July, the correction factor to be added to the EQX time amounted to 61 seconds. By 1 Aug. the correction factor will likely be up to about 85 seconds. However, the 1 Aug. estimated correction factor is based on the (risky) assumption that the present rate of change is constant. Recent history has illustrated the hazards in so assuming!

ASR will print correction factors based on reliable data for the next several months or until the correction factor shows signs of stabilizing. Concerned amateurs are encouraged to make their own observations using the most sophisticated techniques available to them. AOS/LOS times often can yield suggestive values. Since higher frequencies are less affected by ionospheric refraction, it is strongly advantagous to use Mode J for this purpose.

For the benefit of those interested in the precise orbital values for AO-8, the following data will be of interest (supplied courtesy of Project OSCAR, W6XN):

AMSAT-OSCAR 8 orbital period:	103.189286 min. (orbit 17022)
Rate of change in period:	-0.000114 sec/orbit
Longitude increment:	$+25.7995$ deg/orbit
Rate of change in increment:	-1.2×10^{-6} deg/orbit
Reference orbit (actual):	8 Jul. 81, 17025, 00:18:43, 66.3°W

New AMSAT QSLs Showcased

AMSAT Headquarters has announced the availability of the long-heralded AMSAT QSL cards. The distinctive cards feature a NASA-Apollo 16 photograph of Earth and an AMSAT DL photo of Phase III juxtaposed. Martha at Headquarters has samples and order blanks for interested parties. Please send her a S.A.S.E. for a sample. The initial price of the QSLs has been pegged at $35 plus shipping/handling for 500 (minimum order).

Nominees List Told

At press time the list of nominees for the AMSAT Board of Directors had swelled to eight. Vying for the four open seats will be the incumbents: W6SP, VE2VQ, K1HTV and W3GEY. Other nominees include W6CG, W3XO, KL7GRF and WØCY. In addition, there is the possibility that one or more nominees will be originated in Europe, Asia or Africa. Since the mail transit time from these continents had not expired at press time, we cannot say with certainty that there will be no further nominations. Nominating petitions, however, had to be postmarked no later than 30 June 1981 in order to be accepted as valid.

All nominees are required to submit brief biographical data which will be included in the ballot mailing. The mailing of the Official ballots will take place in late July. All current AMSAT members will receive the ballots by first class mail. The ballots will *not* be included in *ORBIT* or *ASR* to avoid any confusion. The ballots are returnable to AMSAT Headquarters, P.O. Box 27, Washington, DC, not later than 17 Oct. 1981.

ASR Editor Towers Over New England

Many, if not most, *ASR* readers are members of ARRL and consequently read and enjoy *QST*. How many of you recognized *ASR* Managing Editor, W1XT, Bob Myers, on the *QST* cover in the July 1981 issue? (Bob's the one with the hat). Surprised? Your Editor was too! The photo was taken a number of years ago when Bob was not chained to an Editor's desk, we suspect. From the photo it appears the team on the tower has got things just about right; nice torque arms on the tower guys; substantial appearing safety belts, etc. I just wonder about that pair of pliers dangling from his rear pocket. Hope those below had their hard-hats on!

Talking about *QST*, we are particularly gratified to see *ASR* mentioned prominently in July *League Lines, page 10. League Lines* is likely the most read Amateur Radio column in the world. For *ASR* to be thus mentioned cannot but help to spread the word about AMSAT's new bi-weekly newsletter. The *League Lines* mention has already generated a strong interest/response from the general amateur radio community. Our thanks to ARRL!

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